

NEW COLOR FILTER GLASSES

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Part II

MAR 14 1968

GROUP 250

Temperature Colored Glasses with Sharp Cut, and Infra-Red Transmitting Black Glasses
Color Filter Glass Catalog No. 365 e, Pages 22 and 23

Late in 1963 the temperature colored glass type **RG 780** was taken into our manufacturing program. This infra-red transmitting black glass has a sharp cut, which is characteristic of temperature colored glasses.

An almost colorless temperature colored glass, under the designation of **GG 400**, cutting sharply at the shortwave end of the visible spectrum has been developed. Its cut is by 20 nm lower than that of the lightest temperature colored glass type, so far known, GG 15. Glass types GG 15, GG 3 and GG 5 which did not have very steep curves in the low transmission area, have been greatly improved with regard to slope and, under the new designations of **GG 420**, **GG 435**, and **GG 455**, together with GG 400, form a group of glasses presenting the most important characteristic of particularly sharp cuts. New methods of coloring had to be used in order to ensure safe production of the new glass types. The low absorption in the red spectral region, which is not detrimental when using them as sharp cut filters in thicknesses below 10 mm, results from the manufacturing technique.

A red glass type RG 645 cutting at 645 nm has been added to the group of the temperature colored glasses, so that up to the wavelength of 665 nm there is a range of sharp cut glasses in intervals of no more than 20 nm.

A remarkable improvement in the transmission curve and in glass quality has been achieved with the temperature colored glass type RG 9, which, in past, has been produced as sheet glass, but now is made as block glass under the type No. RG N9. It is distinguished from the other temperature colored glasses by its selective transmission and a particularly low spectral background in the infra-red region from 1,2 to 1,8 μ .

Because of evident similarity in the transmission curves of the infra-red transmitting black glasses UG 8 and RG 7, production of glass type RG 7 has been discontinued.

UG 8, because of its sharp cut characteristics was given the new designation "RG 1000".

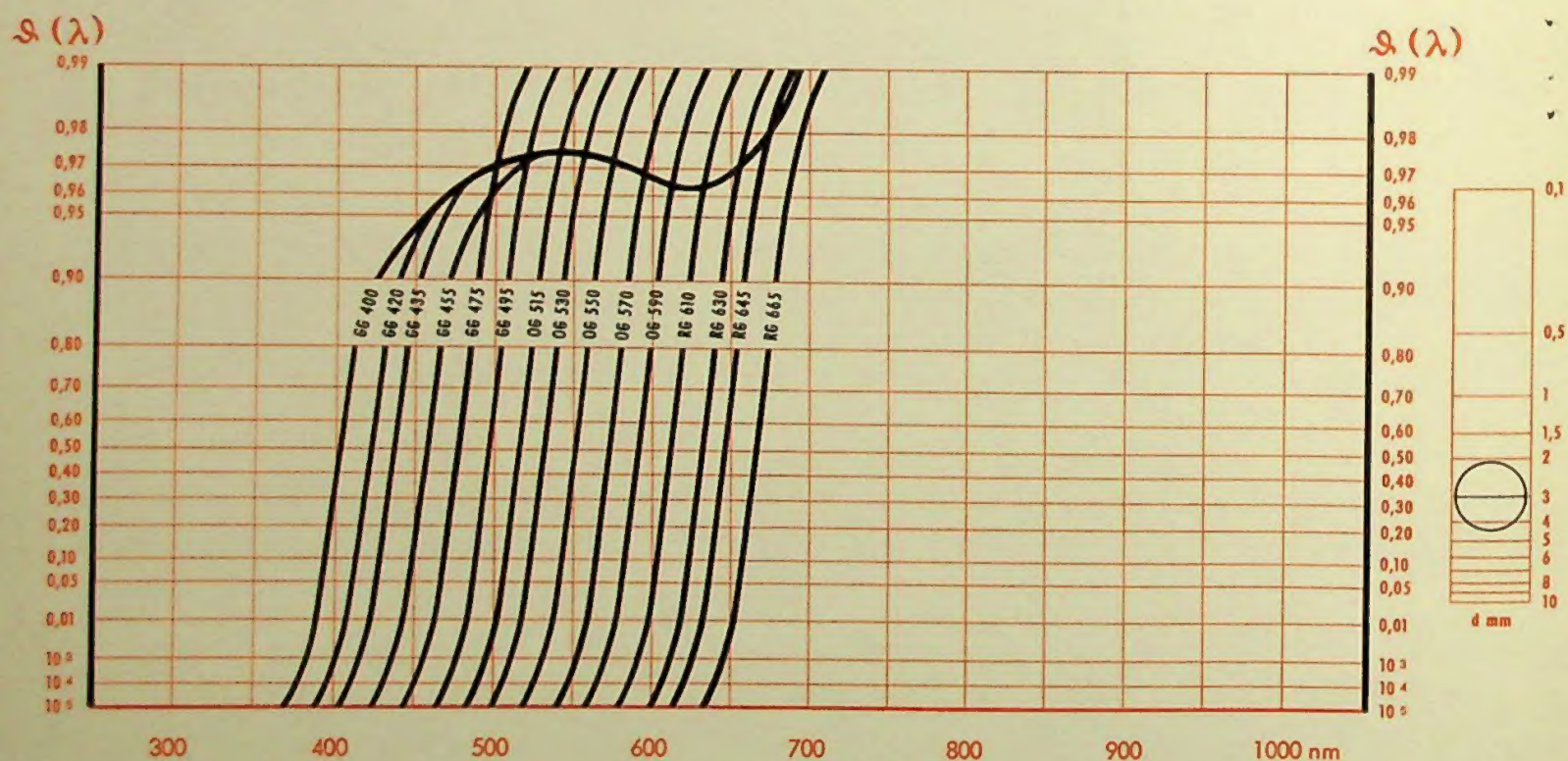
The "cut" of the temperature colored glasses depends on the conditions of the temperature treatment. For this reason there may be variations from the catalog values even within the same melt. The normal tolerance on the cut wavelength as per catalog is ± 7 nm. If a closer tolerance is wanted, samples should be submitted or the cut wavelength must be specified by giving λ_H , the wavelength at which internal transmittance is 0,50, and the tolerance applicable.

The values of λ_H relate to a temperature of 20 °C. The temperature coefficients of transmission are given on page 4 of leaflet 3504/1e.

Colored Glass Group: Yellow, orange, and red temperature colored glasses with sharp cut

Glass type new Designation	old	Remarks	Color	approximate cut location λ_H in nm at thickness		Specific gravity s	Stability H	Correction factor P_d	Thickness applicable to transmis- sion curve d mm
				2 mm	3 mm				
GG 400		A	colorless	397	400	2,72	③	0,91	3
GG 420	GG 15	A	colorless	417	420	2,72	③	0,91	3
GG 435	GG 3	A	yellow	432	435	2,72	③	0,91	3
GG 455	GG 5	A	yellow	452	455	2,72	③	0,915	3
GG 475	GG 7	A	yellow	472	475	2,72	③	0,915	3
GG 495	GG 14	A	yellow	492	495	2,73	③	0,915	3
OG 515	OG 4	A	orange	512	515	2,73	③	0,915	3
OG 530	OG 1	A	orange	527	530	2,73	③	0,915	3
OG 550	OG 5	A	orange	547	550	2,73	③	0,915	3
OG 570	OG 2	A	orange	567	570	2,73	③	0,915	3
OG 590	OG 3	A	orange	587	590	2,73	③	0,915	3
RG 610	RG 1	A	red	607	610	2,74	③	0,915	3
RG 630	RG 2	A	red	627	630	2,74	③	0,915	3
RG 645		A	red	642	645	2,74	③	0,915	3
RG 665	RG 5	A	red	662	665	2,74	③	0,915	3

A = Temperature colored glass (variation of "cut" position!)

 λ_H = Wavelength giving internal transmittance 0,50

It is recommended to use the temperature colored glasses (page 22 and 23) in thicknesses of at least 2 mm.

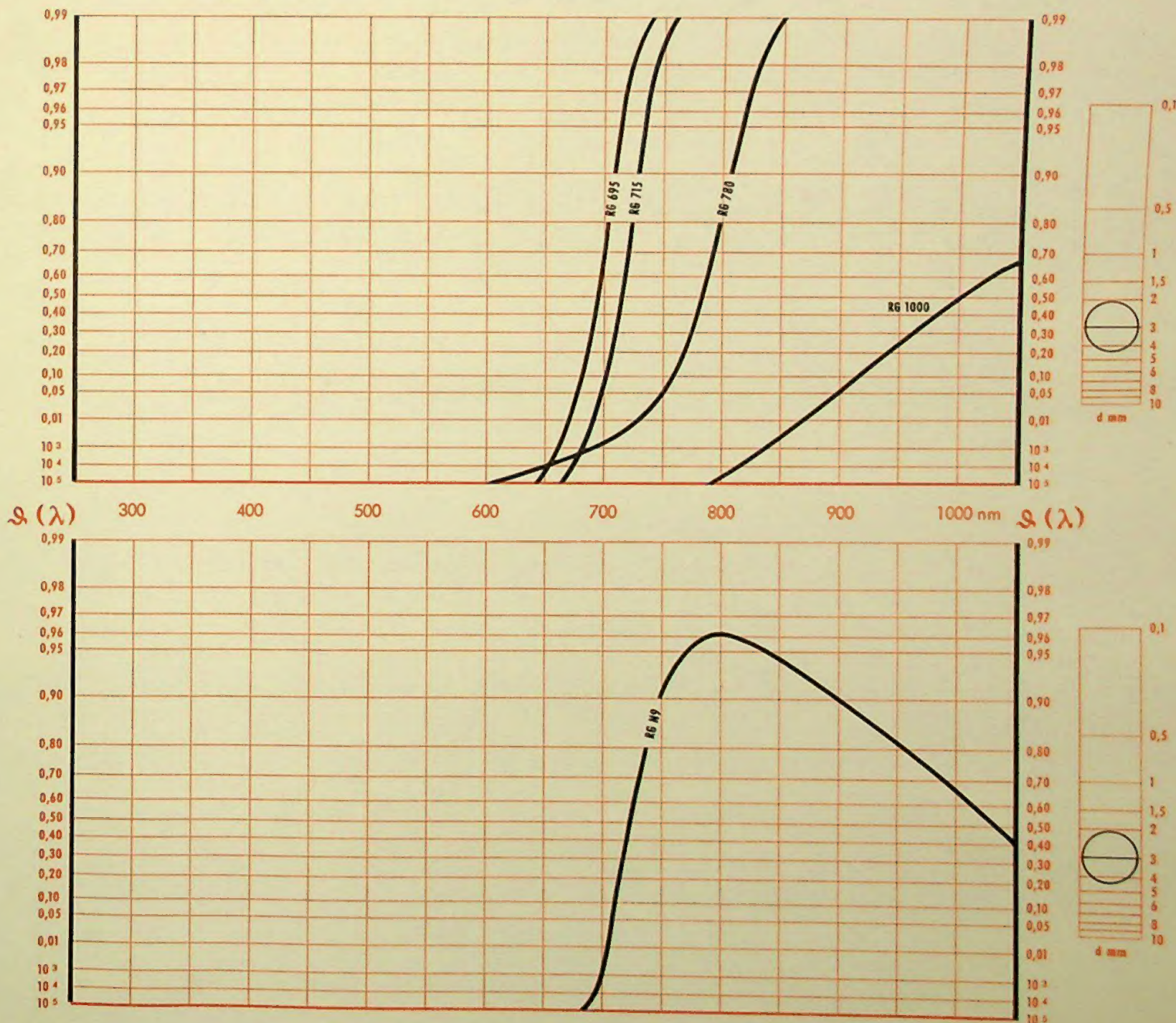
Internal transmittance for wavelengths from 1 to 3 μ as per IR-table on page 4.

Colored Glass Group: Infra-red transmitting black glasses

Glass type		Remarks	approximate cut location λ_H in nm at thickness			Specific gravity s	Stability H	Correction factor P_d	Thickness applicable to transmis- sion curve d mm
new	old								
Designation			2 mm	3 mm	4 mm				
RG 695	RG 8	A	691	695	698	2,74	③	0,915	3
RG 715	RG 10	A	711	715	719	2,74	③	0,915	3
RG 780		A	775	780	785	2,76	③	0,915	3
RG 1000	UG 8		970	1000	1020	2,74	②	0,915	3
RG N9	RG 9	A				2,61	②	0,915	3

A = Temperature colored glass (variation of "cut" position!)

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Internal transmittance for wavelengths from 1 to 3 μ as per IR-table on page 4.

IR-Table

Glass type	Thickness mm	Internal transmittance $\bar{\nu}$ (λ) for λ in μ										
		1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0
GG 400	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,95	0,92	0,40	0,12
GG 420	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,95	0,92	0,40	0,12
GG 435	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,95	0,92	0,40	0,12
GG 455	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,95	0,92	0,40	0,12
GG 475	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,95	0,88	0,66	0,18
GG 495	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
OG 515	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
OG 530	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
OG 550	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
OG 570	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
OG 590	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
RG 610	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
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RG 645	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
RG 665	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
RG 695	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
RG 715	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,67	0,14
RG 780	3	0,99	0,99	0,99	0,99	0,99	0,98	0,97	0,96	0,89	0,40	0,17
RG 1000	3	0,50	0,88	0,95	0,97	0,98	0,98	0,95	0,93	0,91	0,51	0,38
RG N9	3	0,67	0,01	0,001	0,001	0,001	0,03	0,14	0,28	0,33	0,14	0,05

Special Note

The curves shown in this leaflet relate to those thicknesses which permit particularly good observation of the course of the transmission curves. However, customers are free to order those thicknesses which are best suited to their purposes. For this reason, color filter glasses are made to order. It is necessary, therefore, to specify size and thickness in orders and inquiries. For technical reasons we recommend that the glasses are used with a minimum thickness of 2 mm.



JENA^{ER} GLASWERK SCHOTT & GEN., MAINZ

(West Germany)

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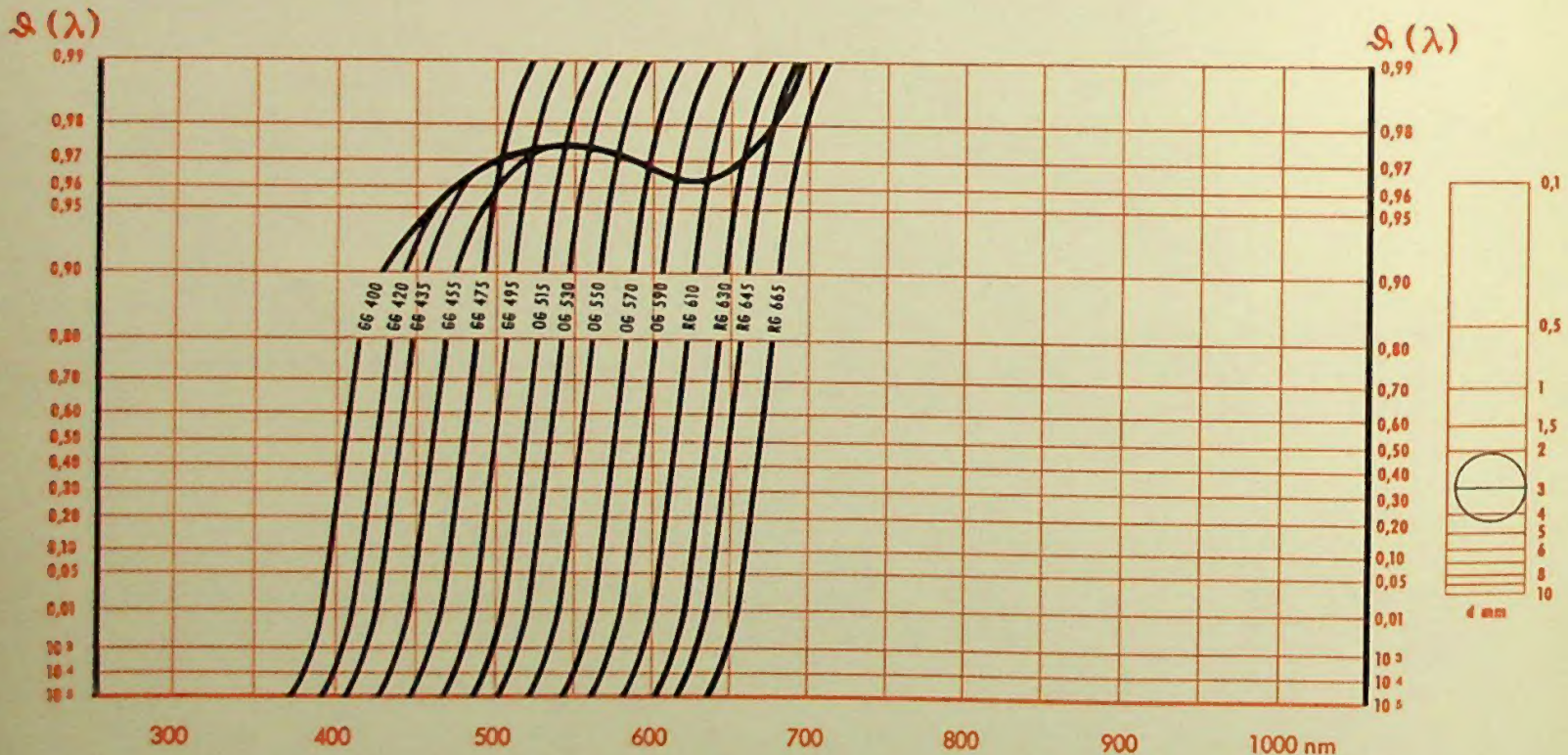
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Colored Glass Group: Yellow, orange, and red temperature colored glasses with sharp cut

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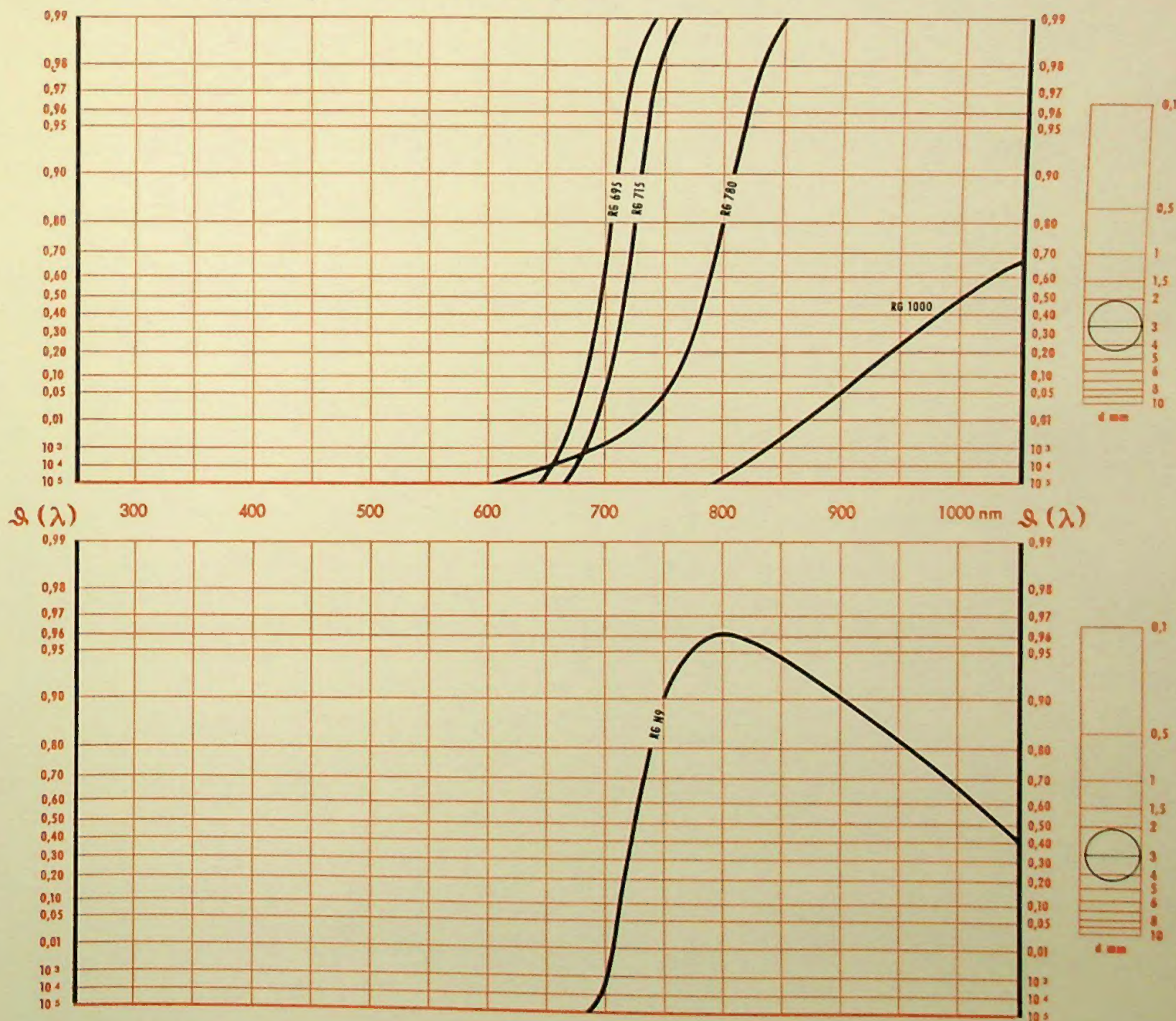
Colored Glass Group: Infra-red transmitting black glasses

23
new

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(West Germany)

Printed in West Germany

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